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HEARINGS

BEFORE THE

SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,

HOUSE OF REPRESENTATIVES,

CONSISTING OF

MESSRS. LITTAUER, MARSH, WALTER I. SMITH,
TAYLOR, AND BRUNDIDGE,

IN CHARGE OF

THE FORTIFICATION APPROPRIATION BILL,

CONCERNING

SENATE AMENDMENTS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1904.

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THE FORTIFICATION APPROPRIATION BILL.

CONCERNING SENATE AMENDMENTS.

March 22, 1904.

At a meeting of the subcommittee, of the Committee on Appropriations, in charge of the Fortification Appropriation bill, the following hearing was had concerning certain amendments of the Senate made to the bill:

Hon. Lucius N. Littauer, Chairman, presiding.

STATEMENT OF MR. SIMON LAKE, OF BRIDGEPORT, CONN.

Mr. **Littauer**. Mr. Lake, we desire you to describe to us fully the particular advantages of your submarine boat in connection with coast fortifications, or the submarine defense connected with the fortification of our harbors.

Mr. **Lake**. Now, Mr. Chairman, I presume in order to get a correct understanding of that, the best thing for me to do would be to briefly describe the arrangement of the boat, which I can do by referring to this diagram.

This picture here shows the boat running just under the surface of the water, and that instrument, which we call an omniscope, protrudes above the surface of the water about 1 foot. This instrument is 6 inches in diameter, and gives an all-round view of the horizon, so that a man in the boat submerged can view any object on the surface in about the same manner as he would by looking through a pair of binoculars.

Mr. **Marsh**. A pair of what?

Mr. **Lake**. Binoculars, spyglasses, such as all seamen use to pick up a ship in the distance. This instrument has the advantage over the ordinary binoculars, in that it gives an all-round view—that is, we can see ahead of us, back of us, and on either side, all at the same time, and we have found no difficulty in open weather in picking up a ship a distance of several miles. The instrument also gives the direction; it is like a camera obscura or periscope as used by the French. The disadvantage of both of those instruments is that they do not give a sense of direction to the man in the boat submerged, neither do they give any idea of distance.

The **Chairman**. What particular use would that instrument you are now describing, the omniscope, be in connection with coast fortifications?

Mr. **Lake**. The particular advantage of that would be, if these vessels were anchored we will say, a matter 4 or 5 miles offshore, if these submarine boats were anchored 3 or 4 miles offshore, acting as picket boats, to notify the forts, and by means of the forts the entire coast, if an enemy were seen approaching.

Mr. MARSH. Would you have telegraphic communication?

Mr. LAKE. We would have telegraphic or telephonic communication.

Mr. LITTAUER. You mean you can have?

Mr. LAKE. We can have.

Mr. LITTAUER. Have you ever used telegraphic or telephonic communication from your boat placed a mile or two outside of a harbor's mouth?

Mr. LAKE. No, we have not; but we have established communication from the bottom of the Patapsco River, as you will see here in the New York World of January 16, 1898. At that time we made our first experiments there. We submerged on the bottom of the Patapsco River, and we established communications with Washington, Baltimore, and New York.

Mr. LITTAUER. In other words, you established, between your boat and the land, communication?

Mr. LAKE. Yes.

Mr. LITTAUER. How far was your boat away from the land?

Mr. LAKE. It was not very far at that time. It was in the Patapsco River, probably not over a hundred yards. But we have picked up cables in the open, telephone cables, a considerable distance from land, which we could have tapped if he had seen fit, and established communication. We did not do so because we thought the telephone companies would object to it, which they undoubtedly would have done, but we have, as I say, picked up these cables in the Chesapeake Bay and Narragansett Bay, regular telephone cables, which were in use probably while we had the bight of it hauled up in the boat, when it would have been an easy matter to have tapped it.

Mr. LITTAUER. From that you infer the specific feature of this omniscope in connection with the defense of our harbors could be adapted to the connection of telephonic or telegraphic communication at some point 2 or 3 miles outside of the harbor?

Mr. LAKE. Yes.

Mr. LITTAUER. That is an inference not yet proved by actual experience?

Mr. LAKE. Not accomplished by actual experience, I would prefer to put it; but in the opinion of all officers who have inspected this, they have not raised the question. I requested the Navy Department to embody that as one of the tests. They refused to do so, because, they said, "We are willing to grant it. There is no question about it."

Mr. MARSH. No question about your communication back and forth by telephonic communication?

Mr. LAKE. Yes, sir.

Mr. LITTAUER. Could not any boat that was submerged a certain distance outside of a harbor, which was connected with cable, make the same telephonic or telegraphic communication?

Mr. LAKE. As you put it, yes; providing they could secure that connection.

Mr. LITTAUER. They would have to carry the wires with them when they were going out to that point?

Mr. LAKE. We do not propose to do that. We propose to have secret offshore telegraph or telephone stations, as we might say. The wires are laid out there, and that point is known.

We do not propose to remain in connection with those wires at all times. That would tie you to the end of the wire. We propose to be able to leave that wire and go and attack the enemy, if necessary, and then come back, pick up the wire again, and report.

Mr. LITTAUER. Pick up the wire and get in communication?

Mr. LAKE. Yes. For instance, if we had these boats off Sandy Hook—we will say we would ordinarily lie there in time of war—at anchor, with a cable communication; but if we should receive word over the wire that the enemy is bombarding Ocean Grove or Long Branch, or some of our seaboard cities, and we receive instructions to go down there and attack them, we do so. We would possibly be extending the coast-defense system much farther than has even been anticipated, I think; but we could drop that connection, go down there, and come back and report.

Mr. LITTAUER. That is the scouting phase——

Mr. LAKE. Yes; but it is affording protection to our coast cities, which is coast defense. To do that it is necessary to have a diving compartment. That is very simple. I have been engaged in the wrecking business in years past, and have used these submarine boats in that way. I do not know whether I can make it clear to you gentlemen. You have a range here, for instance [indicating]. We will take that up-and-down piece of the window and the Washington monument as one range, and take this and the corner of that building as another range. This point here is the exact spot where our telephone cable would be——

Mr. LITTAUER. That is preeminently scouting work that you are referring to now, not so particularly in connection with what has generally been considered coast defense?

Mr. LAKE. Well, of course, that you and the officers are better able to determine than myself. That is one of the phases which they have considered of value. Now, as to anyone else taking this up, I would say that the first thing necessary for that is a diving compartment, so we can send a diver out and pick up this cable and make our telephone connection.

Mr. LITTAUER. Either a diver or a grapnel to bring this cable that is at this immediate point to within your grasp, so that it could be used?

Mr. LAKE. That would be necessary. Now, we have patents covering this diving compartment. In addition to that we have patents covering this system; that is, the system itself is covered very broadly. The mere fact, I may say, is covered by patents. We have not only constructive patents, but the method patents which practically cover the fact that you do it. It was new, and we got fundamental patents for that reason. It would not be possible for anyone to enter that field without infringing our patents. I do not presume that they would do so, but I am sure the United States Government would not care to have them do so. It has taken years and has cost nearly four hundred thousand dollars to produce these things. I am sure no one in the United States Government would care to assist anyone else in filching our rights from us.

Now, to come back to this omniscope, that is the only use, however, of this device. This instrument assists in aiming our torpedoes. The omniscope gives the distance the ship is off; it is graduated so that we can judge the distance the ship is away, and it also enables us to aim our torpedoes. In other words, there is a hair line on the front of the central glass of this omniscope. There is also a hair line [indicating]; the compass is located here in this boat, in the top of the conning tower, and there is a hair line on an arrangement that moves as this omniscope is moved. We turn that around and bring the hair line on the target. That moves this hair line directly below the compass [indicating].

Mr. MARSH. The hair line that is in the conning tower?

Mr. LAKE. That is in the conning tower directly below the compass. The steersman standing here, then, simply brings the ship's head so that the lubber line on the compass is directly intersected by the hair line. Then the torpedoes are correctly aimed, and as long as the torpedoes are being correctly aimed there is a little buzzer that rings - that shows whether the ship is headed directly toward the enemy. We have, when submerged, picked up a Long Island Sound steamer and kept the buzzer ringing right on the stem of that boat for a period of at least ten minutes.

Mr. LITTAUER. The use of your omniscope, as you are now describing it, is particularly valuable in connection with naval warfare. What purpose would the omniscope serve in connection with the use that such a boat would be for coast defense?

Mr. LAKE. This boat, being fitted to fire the regulation Whitehead torpedo, would have certain stations off the entrance of our harbors or some of our sounds and bays, where in times of fog, severe rains, or snow storms, an ememy might approach.

Mr. MARSH. Without being seen?

Mr. LAKE. Yes; and run by the forts, owing to the distance away. Take such a locality as the entrance of Long Island Sound or the entrance to Chesapeake Bay. Take even Sandy Hood. I have lived there for a number of years, and I know that in certain seasons of the year, the spring, for instance, there is so much fog there that ships could probably run in through the east channel, and I have often seen it when they could run in through the main channel without being seen from the shore. That is a comparatively narrow point. Take the other points I have mentioned, even in a severe rain storm, I do not believe they would be able to see them from the shore fortications.

Mr. LITTAUER. But even in times of peace the commanders of ships would hardly dare, under such conditions, to enter the channels, and in the time of war, with the probability of their being mined, they would be less apt to do so.

Mr. LAKE. That is the point exactly. If the mines were there, and were intact, they would hesitate to enter; but if they themselves possessed boats of this type, which they could send in ahead of their ships and destroy the mines, then they would not hesitate for a moment.

I do not know that I am sufficiently well posted to give an opinion as to whether this would be under the army control or navy control, so far as that is concerned. I do know this, that whoever has control ultimately of these boats it is the desire of both branches of the service to never let any of the enemy get into our harbors.

Now, this has been cited to me by Major Murray much stronger, I might say, than he has put it in his report, although I do not think it would be possible to write a much stronger report. He has gone further than that report. He said to me this: "Mr. Lake, ever since we started the investigation of your boat, about a year ago, we have been considering you in the light of an enemy." By which he meant that the board had considered this question with relation to its capability for destroying our present mine defenses, which is, as he said, their principal reliance. "Simply because in times of fog and storms and certain conditions of atmosphere it has been proven even that they could slip by under the searchlights on clear nights. We rely upon those mines. Now, if an enemy should possess a boat of this type, they could completely destroy the efficiency of our present mining system. We have been trying to devise some means to offset that"——

Mr. LITTAUER. Let me ask you a question. Can this boat travel across the ocean?

Mr. LAKE. Yes, sir—[quoting]—"We have been trying to devise some means to offset that during the past year."

Mr. MARSH. You are quoting from Major Murray?

Mr. LAKE. Quoting from Major Murray.

Mr. MARSH. Major Murray, of what?

Mr. LAKE. Of the School of Submarine Defense, in charge of our defenses, both on the Atlantic and Pacific coasts. "And we came to the conclusion that it was absolutely impossible to prevent their destruction by boats of this type, and we came to the conclusion that the only thing we could do was to adopt you for ourselves, to replace, or as a substitute for, the present mines."

Mr. LITTAUER. As a substitute for the present character of mines?

Mr. LAKE. Yes, sir.

Mr. LITTAUER. Was his idea that we should eliminate such mines and fixed torpedoes as we now have and place these boats in their stead?

Mr. LAKE. I would not care to quote him as saying that, but I think that his idea is, that eventually it will be necessary to abandon the fixed mines with cable connections to the shore and establish what we might call an automobile base to fire the Whitehead torpedo.

Mr. MARSH. Where is his report?

Mr. LAKE. This is something that came up in conversation on the subject. In his report he does not go that far, but he does recommend the purchase of five of these boats for certain localities, where, at the present time, owing to depth of water, swift currents, and other conditions, we have not the fixed mines. He does not go so far in his report as to state that these will displace the present fixed mine. He only asks for boats where we have not any fixed mines. But I think that the opinion of the entire board is that ultimately, when other countries and possible enemies would get these boats, it will be necessary to abandon the fixed mine with cable connections to the shore entirely.

Mr. LITTAUER. That is a very broad opinion, that as yet we have nothing except a conversation to back.

Mr. LAKE. That is all. I simply state that, but I state that as my opinion, as you asked for, and it is verified by their favorable opinion if it is not improper for me to so quote.

Mr. MARSH. You know whether it is proper to quote it or not, Mr. Lake.

Mr. LAKE. I feel satisfied they will not take any exceptions to my quotations.

Mr. MARSH. Is Major Murray here in the city?

Mr. LAKE. He is at Fort Totten, N. Y., Willets Point, the lower entrance of Long Island Sound.

Mr. BRUNDIDGE. To what depth have you been down with the boat; that is, the greatest depth you have been down, and how long have you remained there?

Mr. LAKE. The greatest depth we have been with this boat is 50 feet.

Mr. BRUNDIDGE. Why was not an experiment made to carry it to a greater depth than that?

Mr. LAKE. Simply because 50 feet is considered a pretty good depth. I doubt if there is any other submarine boat in this country that ever reached that.

Mr. BRUNDIDGE. I understood it was claimed that the depth was 150 feet.

Mr. LAKE. That is the maximum depth for which the vessel is designed.

Mr. BRUNDIDGE. It has never been tried at a greater depth than 50 feet?

Mr. LAKE. This particular boat has never been down to a greater depth than 50 feet. And I would like to say in that connection there are very few places along our coast that it would ever be necessary to go to a greater depth than 50 feet. The average depth, as you recede from shore, along our Atlantic coast is 6 feet to the mile, as you go off from the shore. Ten miles offshore would give you a depth of 60 feet. In some cases you can go 150 miles offshore before you will find a very great depth. Take off Galveston, for instance, in Texas; you can go 30 miles and you will not find a depth of 100 feet.

Mr. MARSH. How about Mobile and Pensacola?

Mr. LAKE. I think that there it is a matter of 10 or 15 miles. I have it right here somewhere.

Mr. LITTAUER. Mr. Lake, as I understand, the only point in connection with the depth of these boats would be to pick up cables or something of the like on the bottom of the sea.

Mr. LAKE. Yes, that is the idea. And consequently it is not necessary to go to any very great depth for harbor defense.

Mr. BRUNDIDGE. I want to ask you another question. Under the provisions of the law authorizing the purchase of submarine boats after they have made a test, and a satisfactory test has been made of them, as authorized by the Secretary of the Navy, what reason have you for not making the test?

Mr. MARSH. You mean the competitive test?

Mr. BRUNDIDGE. Competitive test with other submarine boats, so that the Secretary of the Navy, in his discretion, may make his purchase direct instead of coming to Congress and asking for direct appropriation in this particular instance.

Mr. MARSH. In any instance.

Mr. LAKE. So far as the Navy is concerned we have been fighting for three years, and it has cost us twenty years of study and $400,000 to get a competitive test which we have been striving for for the past twenty years, and as the Secretary of the Navy testified before the Naval Committee of the House only a few weeks ago, our only competitor had refused a test. We have been at an expense of $1,000 a week ever since last June trying to get a test.

Mr. LITTAUER. There must be a test before any of the money now available can be used for the purchase of further submarine boats.

Mr. LAKE. Under the naval act?

Mr. LITTAUER. Of last year and this year.

Mr. LAKE. Of last year and this year. That act of both last year and this year was our bill; is in the language of our bill which we have been submitting for three years; and, as I said, it has cost us $400,000 to get in that position. The only other competing company had an appropriation of $200,000 ten years ago.

Mr. LITTAUER. Of which they used how much?

Mr. LAKE. Since that time they have had three other appropriations specifying their particular type of boat, the result of which has been to prevent--that is, the Secretary was directed to purchase a boat of that particular type, notwithstanding the Navy Department, the entire board on construction, supposed to be the highest authority in the Navy, objected to it and wanted it left open.

Mr. LITTAUER. Was there any competitive boat in existence at that time?

Mr. LAKE. Not a boat. At that time inventors were requested by the Government to submit bids. This was in 1893. I submitted, not a bid, simply plans. I did not know of the advertisement on the part of the Government until two weeks before the bids were to be opened. I had been studying and investigating submarine boats for ten years previously. My plans were submitted to the Navy Department at that time. Here is a clipping from the Baltimore Sun which refers to it.

Mr. LITTAUER. We will take your statement for it.

Mr. LAKE. It says, "One of the few novel ideas that have come to light as the result of the recent advertisement for plans for a submarine naval boat, involves the construction of a craft that can be sunk by admitting a limited quantity of water, and will then run around on the bottom of the ocean on wheels." And then there is an article from the New York Tribune of October 24, 1894, which describes that boat, which is substantially this boat which we have built. It is substantially the boat which the French have been building for the last four or five years. They have adopted that boat with the hydroplane, the same as we have it there [indicating], as their standard type.

I did not know that Washington was the proper place to which to come to get recognition for this. During the Spanish-American war the *Argonaut* was down at Hampton Roads cruising along the coast.

Mr. LITTAUER. Whose boat was that?

Mr. LAKE. That was one of our first experimental boats. When the *Maine* was sunk we offered the boat to the Government free of cost for the purpose of inspecting the *Maine*, and enabling the officers to go down there to make an examination of her themselves. When war was declared——

Mr. LITTAUER. How could an officer make an examination of a submerged ship from your boat?

Mr. LAKE. Simply go down on the deck of the ship if necessary; or go right down alongside of her.

Mr. LITTAUER. You simply mean to say the boat has the means of permitting a man to emerge from the boat under the water?

Mr. **Lake**. In many cases it is not even necessary; if the water is clear, it is not necessary for him to go outside. This boat was fitted with powerful searchlights and inspection windows, both at the bow and at the sides. We had the idea that officers could go down and sail around the *Maine*, as we have done around wrecks frequently, and for themselves they could have determined; and not only that, they could have lighted up the bottom and navigated entirely around that ship in increasing circles, if necessary, to find out if there were any other mines in the vicinity, or any cables, or anything of that kind.

Mr. **Marsh**. You say that you offered that boat for that purpose?

Mr. **Lake**. Yes, sir; we offered it for that purpose.

Mr. **Marsh**. It was not accepted?

Mr. **Lake**. No, sir.

Mr. **Marsh**. Was it refused?

Mr. **Lake**. I do not think we ever received a reply. I do not know. I do not remember now whether we received a reply or not. But later, when the Spanish-American war was on, we again offered this boat to the Department for the purpose of cable cutting, but the matter was referred to Mr. Roosevelt, who was then——

Mr. **Marsh**. The Navy Department or the War Department?

Mr. **Lake**. The Navy Department. It was referred to Mr. Roosevelt, and I received a letter from him saying a board would be appointed to examine the boat, but within a very few days after that he resigned as Assistant Secretary of the Navy, and went to the war himself, and that is the last I ever heard of that. Then, for the purpose of interesting the Department, practically, I took the boat down to Hampton Roads.

Mr. **Littauer**. Won't you answer the question I asked you a moment ago, in reference to where you expected this boat could be used to cut the cables? What cables did you have in mind?

Mr. **Lake**. I had in mind just exactly what occurred later, in cutting the cable communication with Cuba, cutting them off from the mother country; also in case they should attempt to mine any of their harbors to prevent our fleets from entering there, that they could cut the cables leading to the shore, which we could have done. Lieutenant Payne, afterwards, who was in one of the cable-cutting expeditions off Cardenas, told me if they had had that boat down there, they could have saved millions of dollars to this Government. Admiral Sampson, as you remember, laid off Santiago for weeks for fear of the mines, so long that when they finally did take the mines up they found they had been covered with a growth of barnacles and very few of them were of any importance. But they could have been destroyed immediately by a boat circumnavigating that mine field, and cutting the shore connections of those cables.

Mr. **Littauer**. This boat could have done that?

Mr. **Lake**. The *Argonaut* could have done that. You might say that this is the province of the Navy. In that particular instance it is. But here is a case that occurred only last week, where it would have been of equal importance to our own coast defenses. Admiral Toga, of the Japanese fleet, went in right in front of the entrance of Port Arthur and planted mines to prevent the Russian fleet from coming out of its own harbor. One of them attempted to come out and was blown up by a Japanese mine. There is a case where it would have been of equal importance to the Army, if I understand their division of work.

Mr. Marsh. To the defense of the harbor and to the attackers of the harbor.

Mr. Lake. To the attack and defense of the harbor. Suppose an enemy were to plant submarine contact mines in front of the entrance to New York Bay, Sandy Hook. It would take months to pick those up. It would be impossible to do it as long as there was an enemy offshore with rapid-fire guns to protect their own mines.

Mr. Littauer. But the only object we would have in picking them up would be to permit our own vessels to go out.

Mr. Lake. In that particular instance it would be to permit our own vessels to go out and also our own fleets to come in, because the submarine mine is dangerous.

Mr. Marsh. To a boat coming in as well as going out?

Mr. Lake. Yes. Now, our own mines we can make inoffensive to our own fleets coming in or going out by cutting off shore connections; but if an enemy plants mines there, he will plant purely contact mines, any one of which will explode on contact. During the civil war there were thirty-odd ships sunk by contact mines, a very crude construction at that time; and there were more ships lost by the explosion of mines than in all other ways combined.

Now, I think we have got a little ahead of our subject, going possibly a little too far into the future. The immediate use, as I understand it, for which they want this particular boat, is to determine these things for themselves, and I think that every one will agree that if the Army is to depend upon submarine boats, whether commanded by naval officers or army officers, the army officers themselves should have one experimental boat, so that they can determine for themselves the real value of this craft. Now, I find I have not answered one of the questions which was asked, and that was in regard to why we object to competition in this particular case.

Mr. Brundidge. I did not ask if you objected to competition; I asked you why the competitive tests——

Mr. Lake. We do not object to competition, but we have already had it in this particular case. This same board, as you will find in the Congressional Record, made a report on boats of the only other competing type, and they did not find them of sufficient value to recommend the purchase of them.

Mr. Marsh. For coast defense?

Mr. Lake. Yes.

Mr. Marsh. But did find this?

Mr. Lake. Yes.

Mr. Marsh. The army board did not recommend the other type of boat that is in existence for coast-defense purposes, but did recommend the Lake type?

Mr. Lake. Now, that is one reason we consider we have had the competition. And we have had it entirely at our own expense. It has cost us twenty years and $400,000 to get that. We do not think the Government should be delayed for a period of three or possibly five years before such a competition could be held in this particular line. We contend that it would be impossible for it to be held, because we hold fundamental patents; we have nearly 30 patents with over

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400 claims covering our particular type of construction, and it would be necessary for them to infringe in order to produce a boat that would do what this does, and even if they were willing to assume the responsibility of infringing it would take them three years, working night and day, to duplicate that craft.

We have been three years on that boat, and we have worked night and day and Sundays. We have used tons of bronze in this boat that cost us from 25 to 30 cents a pound that we put in there for the sake of hastening this matter, while steel would have answered the purpose just as well, from 6 to 8 or 10 cents a pound; so that if authority was given for competition and these people should notify the Secretary of War that they would enter the boat in competition under that act——

Mr. MARSH. Which people do you mean?

Mr. LAKE. I mean the people who are opposing this, principally the Holland Torpedo Boat Company—[continuing] it would be three years before such competition could be held.

Mr. LITTAUER. I think you are confusing us there. There has been no proposed competition between any types of boats by the army board.

Mr. LAKE. Oh, no; not so far as the Army is concerned.

Mr. LITTAUER. But you referred to the Army.

Mr. LAKE. I refer particularly to the substitute amendments that were offered by friends of the Holland Company in place of the Senate's fortification committee amendment, that was offered in the Senate, in which they tried to leave the mattar open to competition, which means a delay of three years at least. Now, you gentlemen all appreciate the fact it would be unreasonable for us to be expected, after never having received a dollar from the Government in perfecting this weapon of war, to be asked to wait for three years more at an expense of thousands of dollars a year. We could not do it.

Mr. LITTAUER. Your boat is not only a weapon of war, but is a boat which I think could be used in the ordinary commercial use of any submarine boat, for the purpose of examining wrecks or taking up property from wrecks, or letting out divers underneath the surface.

Mr. LAKE. We have a boat for that purpose which is entirely different in construction from this. Why, we could build a boat of that type, comparatively cheap and inexpensive to run. This boat is 350 horsepower, and she has three torpedo tubes and the mechanism for operating them, and cost $150,000—more than a boat for commercial purposes.

Mr. MARSH. What is the motive power in this boat.

Mr. LAKE. Gasoline when on the surface; electricity when submerged. Two hundred and fifty horsepower of gasoline and 100 horsepower of electricity, making 350 combined.

Mr. MARSH. You use one on the surface and the other on the subsurface?

Mr. LAKE. Yes; so that it would be impossible——

Now, I am going to say something here that, while it may have no bearing on the subject, it has had a bearing with stockholders and with myself. We are American citizens. We have been working on this for twenty years.

We have expended nearly $400,000, something that I do not think has ever been done in the history of the world in any other country in developing a weapon purely for defense of our country. Now, we have requests from numerous foreign countries for boats. I have one in my pocket that I received yesterday, and I will just read a portion of it. I was asked by another foreign country some time ago——

Mr. Marsh. Do you want to read the whole of it?

Mr. Lake. No; I do not.

Mr. Marsh. Will you tell us who it is from?

Mr. Lake. I will show you the heading [exhibiting letter]. I simply want to read just a portion of it, as follows:

"Also kindly let me know whether you have a submarine torpedo boat ready, which you are willing to sell, and state the price and give full description of same. Kindly also let me know whether you would be willing to sell your drawings for such a submarine boat, and whether you would be willing to send a man out here to superintend the construction of said boat; and also give your terms, conditions, and price."

Now, that is only one communication from a number we have received from that same country, and we have also received requests from other countries, but I would be ashamed as an American citizen to be compelled to go over to some foreign country before my own country recognized me. I am from Bridgeport, Conn.; we have had two men there, Hiram P. Maxim and Hotchkiss, inventors of the Maxim gun and Hotchkiss gun. Maxim was driven to England and Hotchkiss was driven to France. Both of these men have been honored in those countries, and this country has been compelled to buy those guns from England.

Now, I have enough patriotism, and our people feel the same, that we do not believe that that would be done, providing the American people knew the true facts in the case. The first man that was ever interested in this boat, the man who first gave it his approval, was the first engineer in chief of the United States Government; that is, Charles H. Haswell. No man stands higher in the engineering or scientific world than Charles H. Haswell. He was associated with Ericsson, and he told me that Ericsson had the same trouble. He came down here to Washington and finally went away in disgust, and said he would never come back here again. And finally some patriotic citizens of our State, one of whom is a member of Congress to-day, Mr. Sperry, went down in their own pockets and built the *Monitor*, and she was private property at the time she whipped the *Merrimac*.

Those are the facts, and we know that history; and I say we want to be recognized by our own country first, but we can not be driven into bankruptcy for the sake of helping out some other concern. We have not had any representatives down here; we have not been annoying you. We came down here alone; we came with a proposition which we thought was fair on its face, and we said, "We will show you our goods." We have been for ten years trying to get people to look at it. And this recognition coming from the War Department, I want to say, has come entirely unsolicited, and that to my mind is very gratifying. I have held the War Department back for six months waiting for the Navy to take action in this matter.

Mr. Littauer. Has the Navy Department ever examined your boat?

Mr. Lake. Yes. Here is a report by Lieutenant Halligan, who spent five months on this boat, and I think if you gentlemen——

Mr. Littauer. Was he detailed by the Navy Department?

Mr. **Lake**. Detailed by the Navy Department.

We believe we have a weapon of the utmost value for coast-defense purposes. Now, here is an illustration that will show our methods. It was found in the Spanish-American war, as I previously stated, that the mines when finally taken up were, the most of them, useless, owing to a marine growth, and so on, and the cable connections broken.

Mr. **Marsh**. The mines in the Cuban harbors?

Mr. **Lake**. Yes; the marine growth, and currents, and rust, and so on, interfered so that they would not work properly. This is an illustration [exhibiting] showing the men in the diving compartment. That compartment as shown there can be lowered down so a man can go overboard and walk on the bottom, if he wishes. I have walked on the bottom and picked up clams, with ordinary hip boots on, in 40 feet of water, without any diving suit or anything of that kind. I simply walked along. All you have to do is to walk as fast as the boat goes. This [indicating] would be the water line. Of course water would be all around it, but water does not come into that compartment at all, so that if a man put a pair of hip boots on, and they allow the boat to come along slowly——

Mr. **Marsh**. What do you need hip boots for?

Mr. **Lake**. Knee boots would do. Simply to keep from getting wet. Water is usually cold down at the bottom, no matter what season of the year. You can wade right along on the bottom, pick up oysters and clams, go along and spear flat fish. We have done it in the Chesapeake Bay and along the Atlantic coast, and have been 5 miles offshore off Virginia Beach. So that in repairing mines or cables——

Mr. **Marsh**. Or inspecting mines?

Mr. **Lake**. Or inspecting them, is a simple matter. You can go out there independent of surface conditions, because the effect of a wave extends below the surface only equal to its height. That is, ordinary waves. After there has been a heavy storm going on on our coast for some days and gets up a ground swell, we have discovered that extends clear to the bottom, and that is the reason we have made these wheels, so it would allow a certain rise and fall of the boat.

In the old *Argonaut* the wheels were originally fixed, and in that we would go and strike the bottom and rebound. You have got to have the cushion effect. So that an ordinary submarine boat without wheels on the bottom to allow her to travel along and rise and fall would go along and bump and rebound clear to the surface even in 30 feet, as has been shown by the operation of the boats in the British Channel and on the French coast. They can not touch bottom there in a heavy swell. They rebound and have even loosened some of the rivets, they struck with so much force. But by providing these cushioned wheels we go along like a rubber-tired vehicle on an asphalt pavement. The bottom of the ocean is remarkably level, usually hard white sand, and, as I say, the depth increases at the gradual rate of only 6 feet to a mile as you go offshore; many places on the coast it is possible to run 60 miles without finding variations in depth of only a few feet. But up at Newport, where we have been experimenting, there are about as severe conditions as you find anywhere. There it is rocky.

Mr. **Littauer**. That is inside the harbor?

Mr. **Lake**. That is in Narragansett Bay. I presume the rocks

[illegible]

Mr. Littauer. [illegible]

Mr. Lake. [illegible]

Mr. Brundidge. One thing I did not understand. Is this compartment here, which you say runs along the bottom, [illegible] from the main hull?

Mr. Lake. No; here it is here (indicating). It is simply on a larger scale, so as to show the man here.

Mr. Brundidge. That is only one part of the boat?

Mr. Lake. Yes, it has two compartments. Here is the diving compartment; here is the air lock which communicates with the living quarters of the boat. In the boat proper the men have the atmospheric pressure that they have in this room, but in the diving compartment they must have a pressure of air equal to the pressure of the water, according to the depth they are in; otherwise the water would come up and fill that compartment. By admitting the air pressure there the water can not rise.

Mr. Brundidge. That is the reason you do not have the water?

Mr. Lake. Yes; if you invert a tumbler and push it in the water the water will not rise in the tumbler. If you push that tumbler down to thirty-four feet, then the tumbler would be half full of water, but if you force in air again, why, the water would recede, and that is the principle on which that compartment operates. So that in all of our cruises on the coast—Chesapeake Bay, Long Island Sound, and various rivers—we have never yet had anybody get their feet wet in a compartment, because they have had such absolute control of the air.

Mr. Marsh. Where is Lieutenant Halligan now?

Mr. Lake. Lieutenant Halligan is now on the *Glacier*, a supply ship, in the West Indies.

Mr. Marsh. Where is that, Major, that you spoke of?

Mr. Lake. Major Murray is the commanding officer at Fort Totten, which is the school on submarine defense. They govern the submarine mine defenses on the Pacific and Atlantic coasts.

Mr. Marsh. He made a report on this boat, did he not?

Mr. Lake. Yes, sir; recommending the purchase of five of them for certain localities.

As I said before, we probably got a little ahead of our subject by describing the fact that we believed this boat was eventually going to displace mines; but coming back to the present mine systems, I presume you gentlemen are all familiar with the method of laying the mines. I do not know that it is necessary for me to go into that at all.

Mr. Littauer. A little description of it here would help you.

Mr. Lake. As you know, the mines are now usually taken out on small boats with their cable connections, and they are thrown overboard at certain positions. They have an officer who goes along and locates these mines in accordance with a chart which they have plotted ashore, and these mines are capable of being fired from the bomb proofs, usually in the forts.

In some places they have a system of cross ranges, as I have previously described, so that they know when a ship comes directly over the mine; then the mine is fired from shore. It has been found to be a very difficult and dangerous matter to handle these high explosives from a small boat, which is subject to wind and wave. It is very difficult to get them in the proper position, and it is dangerous to handle them and more dangerous in picking them up. If they attempt to pick up one of those mines with the boat rolling, or to make repairs in a seaway, the probabilities are they would disarrange down below their internal mechanism or at their junction box or something like that; and in some cases they may throw the whole system out of order. In making the repairs here, instead of doing that, we would simply go down to the bottom, pick up the shore connection, and underrun that on the bottom, where it would be perfectly quiet, and come along and make an examination of junction boxes, as Major Murray has suggested.

Mr. LITTAUER. Has your boat ever done anything of that nature in actual practice?

Mr. LAKE. No; simply because we have not been permitted to do so. As I say, during the Spanish-American war we went down to Hampton Roads with that object in view, to turn the boat over at that time to the authorities at Fortress Monroe. Captain Casey was the engineer officer in charge, and I saw him in reference to it. He said, "No; I can not permit you to submerge within a mile of the mines. You might accidentally sever the cables." This was at a time when they were expecting the Spanish fleet over at any moment. "You might sever the cables, and I would get a racket from Washington."

Consequently we were not permitted to make that experiment. We would need the cooperation of the War Department to plant these junction boxes, and so on, and I understand the object of this recommendation was for the purchase of one for the school for submarine defenses, to enable them to go through these maneuvers just as they would in time of war, to determine for themselves the efficiency of the craft for that purpose. Now, in taking up the mines, as I said, there was really more danger, I think, even in planting them. One of the Russian ships a couple of weeks ago was blown up by her own mines in planting them—became foul of the screws, or something of that kind.

A boat adapted for that particular purpose could avoid those accidents without any difficulty, in view of the fact that they travel on the bottom. When you stop your machinery here you immediately come to rest. You do not drift off with the current, the winds do not carry you off your course, and the seas are not causing the boat to jump up and down on the cables and tending to break their delicate mechanism, and all that.

Mr. LITTAUER. Have you ever discharged a torpedo from this vessel?

Mr. LAKE. Oh, yes.

Mr. LITTAUER. When submerged?

Mr. LAKE. Yes.

Mr. LITTAUER. At a target?

Mr. LAKE. Yes.

Mr. Marsh. What has been the result of that?

Mr. Lake. That you will find mentioned in Lieutenant Halligan's article the fact that we fired torpedoes. He made one shot. There is the photograph right there [referring to photograph]. That shows the boat there at Newport in the act of discharging the torpedo. The white bubble at the bow of the boat is the torpedo.

Lieutenant Halligan made one shot in Long Island Sound, a distance of about 600 yards. He estimated two oyster stakes on a corner of an oyster plat there (those stakes are usually placed right close together, to signify a certain corner) and the torpedo went between the two of them. We considered that a very remarkable shot, but Mr. Halligan said with a little practice——

Mr. Marsh. How many did he miss?

Mr. Lake. This was the first shot he made. He said he would not expect to do that every time; but at that distance a target 50 feet long he should expect to hit every time. Of course, in a battle ship or cruiser or anything of that kind the target is much longer. In firing a torpedo from a submerged boat you have a much better chance than you have from a surface boat, owing to the fact that she is entirely under the water. Now, when you fire a boat from the surface, fire it above the water, it strikes the surface first, and sometimes the sea will come up and catches that torpedo just about that time and heads it in an entirely different direction from that in which it was aimed. But firing below the surface you are not affected by the surface agitation of the waves, and consequently you make a much better shot.

Mr. Littauer. Is there any other consideration you want to bring before us?

Mr. Lake. Is there any further information I can give you? If there is any other particular question——

Mr. Littauer. It seems to me you have covered all the claims that have been made.

Mr. Lake. I do not want to go into the general discussion of the mine fields, because I consider that the army officers that made that report are much more competent.

Mr. Marsh. Major Murray, you mean?

Mr. Lake. Major Murray and Captains Bailey and Parker. They are much more competent to describe that and, if it is possible for the committee to have them before you, I am sure they would give a great deal of information. Possibly some of the officers of the General Staff, the scientific department of the General Staff, would be able to give you a great deal of valuable information on it, as I understand they also went into the subject very extensively.

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